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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/18/2006

Tokuyuki Nakayama

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EXAMINER

NELSON, MICHAEL B

ART UNIT

PAPER NUMBER

1783

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/593,287	Applicant(s) NAKAYAMA ET AL.	
	Examiner MICHAEL B. NELSON	Art Unit 1783	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 March 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-6,8-11,13-22 and 24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4-6, 8-11, 13-22 and 24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Response to Amendment

1. Applicant's amendments filed on 03/03/10 have been entered. Claims 1, 2, 4-6, 8-11, 13-22 and 24 are currently under examination on the merits.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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5. Claims 1, 2, 4, 5, 8-11, 13-15, 19-22 and 24 rejected under 35 U.S.C. 103(a) as being unpatentable over Toppan Printing Co (JP 2000-106034), see human translation, in view of Minami et al. ("New multicomponent transparent conducting oxide films for transparent electrodes of flap panel displays").

Regarding claims 1 and 2, Toppan Printing Co. discloses a transparent conductive film ([0001]) with a transparent oxide film, a metallic film and another transparent oxide film coated onto a substrate ([0026]). As the materials for the transparent oxide film, gallium and indium are disclosed as being sputtered with oxygen to produce oxides ([0020]-[0021]). Additionally, Toppan Printing Co discloses that there be a three layer structure ([0026]). The metal layer is disclosed as being an alloy of silver, copper and gold with ratios of 98.5%, 0.5% and 1.0% respectively ([0027]). The thickness of the metal layer is disclosed as being 13-15 nm ([0026]).

Regarding the transmittance, while Toppan Printing Co does not explicitly disclose the instant claimed values, it does disclose that it is trying to improve transmittance over other known transparent conductive materials ([0003]) and therefore one having ordinary skill in the art would have altered the thicknesses of the layers and selected the exact refractive indexes of the materials in the layers in order to achieve the optimal (i.e. as close to 100% as possible) transmittance of light at all wavelengths that are required in the final application of the final product.

Regarding the amount of Ga and In, Toppan does not disclose the exact amount at which these two materials should be combined however Minami et al. discloses that GaIn oxides can be provides at varying atomic ratios of Ga and In ranging from 0 to 1.0 (Fig. 6, page 1691). The oxides are sputtered at substrate temperatures of room temperature to 350 Celsius which would

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result in amorphous oxides being formed. Minami discloses that by controlling the amount of Gallium the refractive index of the oxide can be controlled (See Abstract) and that this is advantageous over conventional ITO systems (Introduction, Page 1689) which is the same motivation (i.e. controlling refractive index to improve on transmittance over conventional ITO) that was given in Toppan at [0003]. Hence it would have been obvious to have adjusted the relative amount of Ga and In in the transparent oxide layer, as taught by Minami, to achieve the exact refractive index that was necessary to provide the higher transmittance called for in Toppan.

Regarding claims 4, 5, 8-11, 13-15, 19-22 and 24, Toppan Printing Co discloses all of the limitations as set forth above. With respect to claims 4, 5, 8-11, Toppan Printing Co discloses that there be a three layer structure ([0026]). The metal layer is disclosed as being an alloy of silver, copper and gold with ratios of 98.5%, 0.5% and 1.0% respectively ([0027]). The thickness of the metal layer is disclosed as being 13-15 nm ([0026]). With respect to claim 24, the use in transparent electrodes is disclosed ([0001]). Regarding the surface resistance of claims 15 and 22, Toppan discloses that the three layered structure achieves a surface resistance of 3.

Regarding the transmittance called for in claims 13-14 and 19-21, while Toppan Printing Co does not explicitly disclose the instant claimed values, it does disclose that it is trying to improve transmittance over other known transparent conductive materials ([0003]) and therefore one having ordinary skill in the art would have altered the thicknesses of the layers and selected the exact refractive indexes of the materials in the layers in order to achieve the optimal (i.e. as close to 100% as possible) transmittance of light at all wavelengths that are required in the final application of the final product.

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6. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Toppan Printing Co (JP 2000-106034), see human translation, in view of Minami et al. ("New multicomponent transparent conducting oxide films for transparent electrodes of flap panel displays") as applied to claim 3 above, and further in view of Asahi Glass Co. (JP 09-291356), see machine translation.

Regarding claim 6, modified Toppan Printing Co discloses all of the limitations as set forth above. Toppan Printing Co does not explicitly disclose that the metallic film be a Ni and Au laminate. Asahi Glass Co discloses a transparent conductive film with a metallic laminate of Au and Ni ([0029]-[0032]). The film of Asahi Glass Co is disclosed as being excellent in, inter alia, alkali resistance ([0009]).

The inventions of both modified Toppan Printing Co and Asahi Glass Co are drawn to the field of transparent conductive films and therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to have modified the metallic layer of modified Toppan Printing Co by using the metallic Ni, Au laminate of Asahi Glass Co for the purposes of imparting improved alkali resistance.

7. Claims 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Toppan Printing Co (JP 2000-106034), see human translation, in view of Minami et al. ("New multicomponent transparent conducting oxide films for transparent electrodes of flap panel displays") as applied to claim 1 above, and further in view of Nippon Hoso Kyokai (JP 2004-127719), see English language equivalent Fujikake et al. (U.S. 2006/0152136).

Regarding claims 16-18, modified Toppan Printing Co discloses all of the limitations as set forth above. Modified Toppan Printing Co does not disclose the inclusion of a gas barrier

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film with the transparent conductive film. Fujikake et al. discloses a transparent conductive film on which it was known to use substrates made of, inter alia, polycarbonate ([0003]). The gas barrier layer is disclosed as being made of inter alia, silicon oxide ([0041]) and the placement of the gas barrier film, 2, within the structure of the stack in Fig. 1 shows that it is in between the transparent conductive layer, 1, and the resin base, 3 ([0049]). The film of Fujikake et al. is disclosed as exhibiting improved heat resistance and low moisture absorbance ([0013]).

The inventions of both modified Toppan Printing Co and Fujikake et al. are drawn to the field of transparent conductive films and therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to have modified the transparent conductive film of modified Toppan Printing Co by including a gas barrier layer as taught by Fujikake et al. for the purposes of imparting improved heat resistance and lowered moisture absorbance.

Response to Arguments

8. Applicant's arguments filed on 03/03/10 are considered moot in light of the new grounds of rejection which were necessitated by applicant's amendments. Arguments which are still deemed relevant are addressed below.

9. Applicant argues against the combination of Toppan and Minami however there was no Minami reference cited in the previous office action. The Minami reference cited in the current office action is a scientific Journal article and is different than the Minami Japanese patent document (JP 09-259640) applicant is believed to be referring to in the remarks. The Minami patent was not used in the previous rejection and it is believed that applicant may have mistakenly looked to the Minami patent (JP 09-**259640**) rather than the Asahi document which was cited in the rejection of claim 6 (JP 09-**291356**). Since neither the current nor the previous

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office action uses the Minami patent in the rejection this argument is deemed moot. The examiner has requested a human translation of the Japanese patent referenced in the rejection of claim 6 but in the mean time the machine translation is still available.

10. Regarding applicant arguments against the light transmittance values, as explained above, Toppan discloses, on one having ordinary skill would have known, that in transparent conductive films it is desirable to optimize the refractive index of the materials used and the thickness at which they are used in order to achieve the most transparent film possible at all wavelengths of light used in a particular final application. Hence, given the teachings of the prior art towards adjusting the relative amount of Ga and In to control refractive index in order to enhance transmittance, the light transmittance would have likewise been optimized to within the claimed range.

11. The examiner has also included a copy of a STIC search for Ga/In oxides with Ga at more than 50% and less than 100%. This document is not used in the rejections but is referenced because it is considered relevant to the prosecution in general and should be put on the record.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

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will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL B. NELSON whose telephone number is (571) 270-3877. The examiner can normally be reached on Monday through Thursday 6AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Sample can be reached on (571) 272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Patricia L. Nordmeyer/
Primary Examiner, Art Unit 1783

/MN/
06/03/10